WESTERN BIRDS

Vol. 13, Nos. 1–4, 1982

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Quarterly Journal of Western Field Ornithologists

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Published — July 8, 1983.

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Full Page	4 x 6¾ inches	$60 per issue	$200 per year
Half Page	4 x 3⅜ inches	$40 per issue	$130 per year
Quarter Page	4 x 1 11/16 inches	$30 per issue	$110 per year

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WESTERN BIRDS

Volume 13, Numbers 1-4, 1982

FEEDING BEHAVIOR OF CROWS AND GULLS ON A PUGET SOUND BEACH

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The shoreline bird community of the Pacific Northwest differs from many others in the world because an abundant member is not a waterbird but a crow, the Northwestern Crow (*Corvus caurinus*). Crows are known opportunistic feeders, as are gulls, and many crows throughout the world do feed at least occasionally along marine shores (Goodwin 1976). Consequently, the Northwestern Crow should be adapted to occupy a role as a member of the opportunistic beach feeding guild limited often to gulls. A guild is "a group of species that exploit the same class of environmental resources in a similar way" (Root 1967). Three gulls commonly feed in the intertidal areas of Puget Sound: Glaucous-winged Gull (*Larus glaucescens*), Mew Gull (*L. canus*) and Bonaparte's Gull (*L. philadelphia*). To compare the role of the crow with the roles of the gulls and to see how the members of this particular guild subdivide the available resources, I compared the feeding behavior of crows and gulls along a Puget Sound beach.

STUDY AREA AND METHODS

This study was conducted in Kopachuck State Park, Pierce Co., Washington. The beach studied is typical of many Puget Sound beaches, as described by Weiser (1959), in that it is relatively sheltered from wave action, with the upper parts consisting of cobblestones and the lower parts (up to approximately the 2 m tide line for this particular beach) consisting of sand and mud. Driftwood logs ranging up to about 1 m in diameter litter the beach. The dominant surface animals are the Acorn Barnacle (*Balanus glandula*) and the Periwinkle (*Littorina sitkana*). Because the beach is within a state park, its invertebrate fauna is probably less diverse than it would be if within a less disturbed area. The beach is bordered on the east by a Big-leaf Maple (*Acer macrophyllum*) — Douglas-fir (*Pseudotsuga menziesii*) forest with scattered picnic tables.

I gathered data on foraging crows and gulls during the nonbreeding season (September to March) in 1974 and 1975, and to a lesser extent in 1976. Birds were censused at hourly intervals and their positions on the beach noted: whether in deep water, in shallow water (birds could wade), just above the tide line (where water was still draining), on the middle beach (where the substrate was still wet), on the upper beach (substrate well drained), or on the extreme upper parts of the beach (usually only covered with water at high tide). If the birds were on exposed beach, I recorded whether they were on sand and mud or on rock. I obtained tide heights at census times from newspaper tide charts. Because Glaucous-winged Gulls were sitting most of the time and not feeding, their positions were noted only when they were seen taking food. Other species were almost always feeding when encountered on censuses. I censused only birds found on the beach or in adjacent water and ignored gulls flying or sitting well offshore or crows sitting in the trees along the beach. I made a further comparison between the crows and Mew Gulls by measuring the distance, estimated in body lengths, between food items taken by individuals on the beach at times other than when tides were below 0.7 m and food was superabundant.

RESULTS

NUMBERS AND FEEDING SITES

Results of the censuses for the three most common gulls and the crow are in Table 1. Other gulls, Herring Gull (*L. argentatus*), Thayer's Gull (*L. thayeri*) and California Gull (*L. californicus*), occurred in too small numbers to yield interpretable results. The results indicate that all species were most common at times of the lowest tides, with the crow and Mew Gull decreasing most in numbers as the tide height increased. Crows were the most abundant species on the beach at all but the two highest tide categories when their numbers dropped below those of the Glaucous-winged Gull. Numbers of Bonaparte's Gull were erratic.

The place where a species fed was closely associated with tide height. Bonaparte's Gull provided the clearest example, feeding almost entirely above the water line during the lowest tides and in deep water at all other times.

Crows, on the other hand, fed almost entirely above the water line and only rarely waded into the water to feed (counted only once on a census, but also observed on other occasions). Once a crow was observed picking at a dead fish while standing on a small rock surrounded by water only a few inches deep. Apparently, crows avoid getting their feet in salt water. Crows also ranged higher on the beach than any of the gulls, picking over driftwood and debris left at the high tide line on the upper edge of the beach. However, they shifted closer to the water line at lower tide levels.

Mew Gulls showed an increasing tendency to feed above the water line as the tide level decreased, with only 21% feeding below the water line at the lowest tides. Mew Gulls began feeding above the line at the point where the

tide began to uncover the sandy portions of the beach (94% of the Mew Gulls in contrast to 48% of the crows feeding above the water line fed on the sandy areas rather than on the cobblestones). At other nearby beaches where sand extends up higher, Mew Gulls were also more common at higher water levels.

Even at low tide levels, most of the Glaucous-winged Gulls' food came from below the tide line. The data for the Glaucous-winged Gull, however, were erratic due probably to the sampling method. Except at times of lowest tides, Glaucous-winged Gulls feeding above the line usually fed on carrion or other debris. Otherwise, they fed on live animals.

Hunt and Hunt (1973) found similar changes with Maine gulls. As the tide level decreased, uncovering mud, Laughing Gulls (*Larus atricilla*) moved onto the beach and other gulls switched from other substrates to the mud. In

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Table 1. Numbers of birds present during different tide heights and distribution of feeding places, Kopachuck State Park, Pierce Co., Washington, Sep.-Mar. 1974-75. Numbers of censuses were 10, 11, 15, 6 and 11 for increasing tide heights.

		Feeding place — Percent of observations					
Tide Height (feet)	Mean Number Birds	Deep Water	Shallow Water	Above Tide Line	Middle Beach	Upper Beach	Extreme Upper Beach
Glaucous-winged Gull							
< 2	5.9	44	33	6	17	0	0
2+ – 4	4.6	27	55	0	18	0	0
4+ – 6	2.9	17	0	50	33	0	0
6+ – 8	3.3	100	0	0	0	0	0
> 8	4.1	100	0	0	0	0	0
Northwestern Crow							
< 2	14.3	0	0	44	41	13	1
2+ – 4	6.3	0	1	23	29	38	9
4+ – 6	4.3	0	0	23	49	19	9
6+ – 8	2.3	0	0	33	33	33	0
> 8	0.8	0	0	67	0	17	17
Mew Gull							
< 2	7.1	3	18	8	69	1	0
2+ – 4	1.3	21	21	36	14	7	0
4+ – 6	2.1	82	0	14	4	0	0
6+ – 8	0.7	75	25	0	0	0	0
> 8	0.8	75	25	0	0	0	0
Bonaparte's Gull							
< 2	1.1	0	0	36	64	0	0
2+ – 4	0.2	100	0	0	0	0	0
4+ – 6	0.1	100	0	0	0	0	0
6+ – 8	1.7	100	0	0	0	0	0
> 8	0.6	100	0	0	0	0	0

the present study, although only 48% of all crows foraged on the sand, 86% of those present during lowest tides foraged on the sand. This shift presumably occurred because during the lower tides, sand, which is the substrate most recently uncovered, is more productive than cobblestones.

FOOD TYPES

The three gulls and the crow also fed on different foods as observed at binocular range (I did no stomach analyses, and my visual observations are biased toward large items). Although both gulls and crows are opportunists, and carrion and other debris may compose a significant portion of their diets, most of their food that I observed was live animals.

Crows fed on animals that ranged in size from small unidentifiable items that could be swallowed in one bite with no further handling to items several times the length of a crow's beak and requiring 10 or more minutes to consume. Items much larger than a crow's beak were uncommon, and perhaps were limited to what the crows could carry in their beaks during flight. Foods commonly taken by the crows included crabs (*Hemigrapsus oregonensis* and *Cancer productus* were identified), sand dollars (*Dendraster excentricus*), cockles (*Clinocardium nuttallii*), rock cockles (*Protothaca semidecussata*), small Moon Snails (*Polinices lewisii*) and unidentified amphipods. This diet is similar to, although not as diverse as, the one Butler (1974) described for the Northwestern Crow from pellets. Many prey animals found by Butler were not present in my study area. Sand dollars were not listed by Butler, but were a major food of crows in this study, particularly in late winter. The crows simply picked them off the surface and opened them as gulls open shells by dropping them on rocks while in flight. The crows found most of their food by searching under seaweed and by digging down into the cobblestones with their bills. On a few occasions, crows picked up bits lost by Glaucous-winged Gulls feeding on large items such as crabs.

In contrast to the crows, Glaucous-winged Gulls fed mostly on large items requiring some handling time (e.g., 22 minutes timed for a large cockle), but as with the crow, bill size apparently limited food size. Small items were taken only during the lowest tides when these items are abundant. The gulls usually captured larger items in the water by either diving while flying several meters above the water or dipping while either sitting or wading in water. The gulls then flew or swam back to the beach where they consumed the food. Foods taken by the gulls included small fish, crabs (same species as taken by the crows but apparently with a larger proportion of the larger *C. productus*), cockles and starfish (*Piaster ochraceus*). I never saw gulls feeding on sand dollars.

Cockles were a major food of both crows and Glaucous-winged Gulls, as evidenced by an abundance of broken shells strewn on the beach. Cockles usually remain close to or on the surface of the sand (Ricketts and Calvin 1968) and thus make easy prey.

Mew Gulls fed on items that could usually be swallowed whole with no handling. The few items I could see were small unidentified crabs, amphipods and unidentified worms. Mew Gulls usually found food by walking or swimming along the beach and picking up food from either the water's or the sand's surface, by searching under seaweed, or by foot-paddling (when the gull treads wet sand with its feet, as discussed by Buckley 1966). In this study, foot-paddling occurred in late winter, the same season Williams (1933) observed it in California. A water-sand medium is evidently required for gulls to foot-paddle efficiently.

Bonaparte's Gulls fed on food that was too small to identify, but on several occasions they caught insects while flying swallow-like over the water.

FOOD DISTRIBUTION AND SOCIAL BEHAVIOR

A fourth difference in foraging behavior between these species was the apparent reactions to the dispersion of their food. The larger items that Glaucous-winged Gulls fed on were much more widely spaced on the beach and in the water than were the foods of the other species. Mew Gulls' food was more clumped than the crows' food (Figure 1). These differences, however, were not as distinct at the lowest tide levels when all species were feeding on the abundant and highly aggregated food. A difference in food dispersion usually is not considered a means by which interspecific competition is lessened but rather is another indication that different foods are being chosen. Cody (1974), for example, combined bill measurements and food dispersion into one variable in his studies.

Differences in food dispersion can also lead to differences in sociality, because sociality is important in the strategy animals use to exploit their environment (E.O. Wilson 1975, Wiens 1976). As resources become more unpredictable and less defendable, animals tend less to defend territories and tend more to aggregate, with the flock forming the most stable unit. Corresponding differences were seen in this study.

Mew Gulls fed solitarily when on the beach, except at lowest tides, and usually chased away any other Mew Gulls that approached. For a Mew Gull, food is limited and easily defended in the small patches. When feeding on the beach during lowest tides and at most times out over the open water of the adjacent bay, Mew Gulls fed in flocks or aggregations, which frequently included other bay and shore feeding birds.

In contrast, Northwestern Crows were almost always in small flocks or aggregations, which is often noted as a characteristic of the Northwestern Crow relative to other crows (Johnston 1961). Often several crows moved together along the beach searching for food. When food was found, the group stopped moving and broke down into a loose aggregation, which was joined by other crows. Because of the food's slightly dispersed nature, a crow cannot find and defend it all efficiently, as Mew Gulls can. Consequently, a crow can share food and, besides, will reduce its risk of not finding sufficient

food by later feeding with other crows that have found food (Thompson et al. 1974). Flocking is also advantageous in providing more eyes to look for predators (Willis 1972).

Glaucous-winged Gulls during times of higher tides were territorial. Winter territories are not uncommon in this species (Vermeer 1963, Barash et al. 1975). However, most were not territorial, and those that were, were adults (as is the usual case for winter gull territories; Drury and Smith 1968). Furthermore, the winter territories were not as strict as breeding territories usually are. When large flocks of gulls were present in aggregations in the adjacent

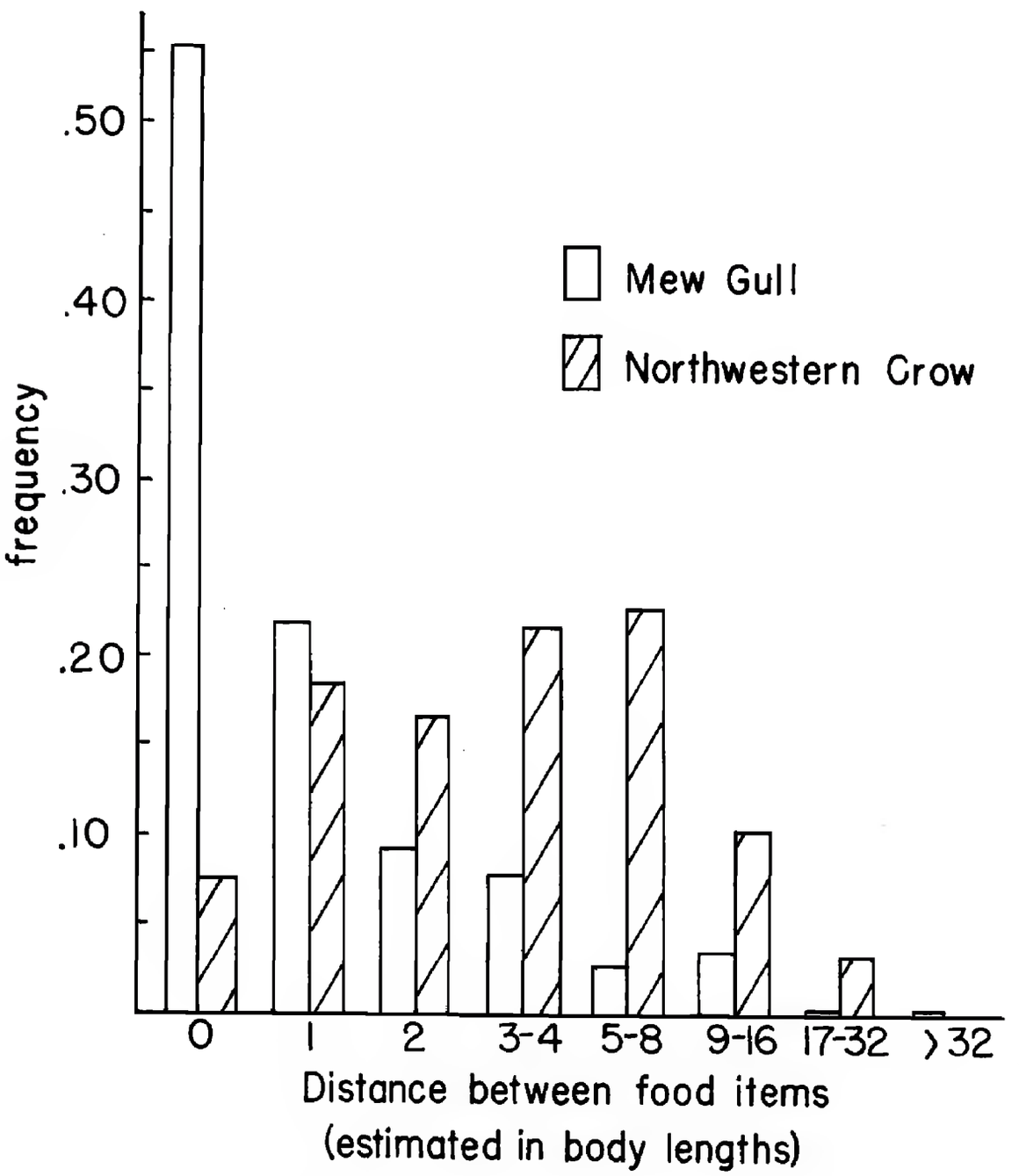

Figure 1. Frequency distributions of the distances between food items for the Mew Gull and the Northwestern Crow, Puget Sound, Washington. Sample size is 209 for the gull and 96 for the crow.

bay, the gulls on the beach were either absent or were seen flying out to join the aggregation. For Glaucous-winged Gulls, food is probably plentiful enough in the shallow water along the beach to form a predictable and defendable source. At times of the lowest tides, territories were not defended at all, probably because food is then abundant. A similar system of territorial and nonterritorial individuals in winter has been well described for wagtails (*Motacilla alba*) by Zahavi (1971) and Davies (1976); when food is abundant, aggregations form, but when food is limited and defendable, territories form.

Among the four species, a dominance heirarchy existed with the larger species dominating the smaller ones (also described by Moyle 1966 for the same three gulls). Mew Gulls especially were often supplanted by crows or by Glaucous-winged Gulls, although apparently only place and not specific food items were in dispute. Glaucous-winged Gulls also attempted to steal food from the crows. However, on two occasions when a Glaucous-winged Gull landed in the midst of a group of feeding crows, the crows chased away the gull. Once, when the crows were feeding on carrion, a crow that appeared to be a dominant individual, because it was in the center of the group, attacked the gull by grabbing one of the gull's wings in its beak and pulling on it.

DISCUSSION

The pattern in food-size consumed is the same as that commonly observed between members of a guild. Smaller species will take food from a range of smaller sizes, and as the species become larger in body size, the range in food is expanded to include larger sizes but still includes the smaller food sizes fed upon by the smallest species (D.S. Wilson 1975). However, the larger species usually prefer larger food items because of higher nutritive content. The limit of food size of an individual animal is determined by the size of whatever that animal uses to catch or handle its food. In gulls and crows, bill size is apparently important, with the smaller Bonaparte's and Mew gulls unable to handle the larger crabs and mollusks that are important in the diets of the crow and the Glaucous-winged Gull. To open mollusks, crows and gulls need to be able to pick them up and to take flight with them, so that they can be dropped.

The importance of bill size in separating the foods of these species can be seen by the ratios of bill sizes in Table 2. A ratio of 1.3 is commonly found in comparing members of the same guild (Horn and May 1977). The small ratio between the Mew Gull and the Bonaparte's Gull may be one reason why Bonaparte's Gull feeds on the beach only at the lowest tides. Food is more abundant then, and competition thereby lessened. Also, while the Northwestern Crow is smaller in body size than western races of the Common Crow (*Corvus brachyrhynchos*), of which the Northwestern Crow is often

Table 2. Bill lengths (of males) and their ratios for the four members of the beach scavenging guild of Puget Sound, Washington. Bill lengths from Ridgway (1919).

Species	Bill length (mm)	Ratio
Glaucous-winged Gull	58.3	
		1.24
Northwestern Crow	47.0	
		1.29
Mew Gull	36.4	
		1.17
Bonaparte's Gull	31.2	

considered to be a race, the bill size is similar (Johnston 1961). A smaller bill would cause more competition with the Mew Gull.

The work of Hunt and Hunt (1973) reveals that the opportunistic beach feeding guilds in both Maine and Europe, although filled mostly by gulls, are organized in the same way as is the Puget Sound guild. They found that in the intertidal usually only three or four species fed and that these fell into three general body size categories. Other gulls with similarly sized bodies were confined to other habitats and were only infrequent visitors to the intertidal. In addition, they found a pattern between body size and ecological role that was repeated in this study. The large species feeds mostly in the water, the medium species feeds mostly on the beach, the small species feeds mostly on mud or sand, and, if there is a second small species, it feeds in the intertidal only during the lowest tides. Table 3 lists the ecologically equivalent species. The Mew Gull, which is found in both Puget Sound and Europe, shows a role change, from the first small species in Puget Sound to the second in Europe. The Black-headed Gull (*Larus ridibundus*), a close relative of the Bonaparte's Gull, fills the role of the first small species in Europe. The Herring Gull shows a habitat shift from Maine and Europe to Puget Sound, where it is common but not in the intertidal.

Examples of ecological equivalence such as this are common (Cody 1974, Cody and Diamond 1975). Cody (1974) states that equivalence is found most often in structurally simple habitats where there is less opportunity for variation in niche patterns. For birds the intertidal is a simple environment. The pattern of bill size in the beach scavenging guilds indicates that differences in food size may be the primary mechanism easing competition and allowing the four species to co-exist. The beach is not stratified sufficiently to allow height or depth criteria to separate resources; this is in contrast to the case in most avian communities, including muddy intertidal areas (Recher 1966). The tide cycle, however, contributes complexity to the availability of resources and, thus also, to resource division by members of the guilds. In Washington, only at the lowest tides is a fourth species (Bonaparte's Gull) able to feed on the beach. Then, apparently, as the tide increases and

perhaps food decreases, differences in range of food size are not sufficient to ease competition. Further tide increases lead to another species (Mew Gull) being unable to feed efficiently on the beach, leaving only two species, which are separating resources also by place. Finally, when the beach is almost completely inundated, in Puget Sound at least, the third species (Northwestern Crow) drops out and only one species (Glaucous-winged Gull) is left, and individuals defend the area against conspecifics.

The crow does not leave the beach at higher tides solely because it is not a water bird, because in Europe, the Herring Gull, the medium-sized species, also is reduced in numbers at times of higher tides (Verbeek 1977). Body size is correlated with the order in which species respond to the tide cycle, both in this study and in Hunt and Hunt (1973). Several factors create this pattern response. First, the interspecific dominance hierarchy may be one factor because the larger birds, which are present on the beach at more times are dominant over the smaller birds. Another factor may be food size. Where the beach changes from cobblestone to sand, there is a corresponding change in the invertebrate fauna (Wieser 1959). A third factor may be that both the crow and Herring Gull (Verbeek 1977) are able to dig with their bills into the cobblestones, something smaller gulls are apparently unable to do.

Consequently, the crow appears to be exploiting a niche in Puget Sound that in many parts of the world would be a gull niche. But does the crow exclude a medium-sized gull? Four medium-sized gulls do occur along the Pacific Coast in winter. These are listed with bill lengths in Table 4. Because

Table 3. The ecologically equivalent species found at a Puget Sound beach[1], in Maine[2] and in northwestern Europe[2].

Niche	Puget Sound	Maine	Europe
Large body, feeds mostly in water	Glaucous-winged Gull	Great Black-backed Gull	Great Black-backed Gull
Medium body, feeds mostly on on beach	Northwestern Crow	Herring Gull	Herring Gull
Small body, feeds mostly on mud or sand	Mew Gull	Laughing Gull	Black-headed Gull
Small body, feeds only in area at low tide	Bonaparte's Gull	None	Mew Gull

[1]From this study.

[2]From Hunt and Hunt (1973).

Table 4. Bill lengths of some male Pacific Coast gulls.

Species	Bill length (mm)
Herring Gull	54.2[a]
Thayer's Gull	52.2[b]
California Gull	49.8[a]
Ring-billed Gull	44.3[a]

[a]From Ridgway (1919)

[b]From Dwight (1925)

Thayer's and Herring gulls both approach the Glaucous-winged Gull in size (Table 2), they may be excluded by competition from feeding in the intertidal because their diets would overlap too much with that of the Glaucous-winged Gull. Ring-billed and California gulls, however, are both much more similar in size to the crow. These last two gulls are common in migration through the Puget Sound region, but are uncommon in winter, increasing in numbers south of 46°N latitude (Table 5), which is also approximately the same latitude given as the southern boundary of the Northwestern Crow's range (AOU 1957). That these two gulls tend to be more terrestrial than most gulls may allow the crow to more readily exclude them by competition. The crow

Table 5. The average numbers of California and Ring-billed gulls per 10 party-hours on 1975 Christmas Bird Counts[1] from the coastal Pacific Northwest, by latitude.

Lat (°N)	Counts	California Gulls	Ring-billed Gulls
50	2	0.0	0.0
49	8	+	2.1
48	6	0.3	0.2
47	3	11.1	2.9
46	2	0.6	0.7
45	3	12.2	16.0
44	1	50.2	17.3
43	1	17.3	22.3

[1]From *American Birds*.

may also be able to exclude them because it is a permanent resident in the Pacific Northwest. For one species, such as the crow, to competitively exclude another one, it must limit that other species' population more than it does its own. For the case of competition between migrants and residents, in general, migration hazards can reduce populations of migrants to the point that the permanent resident population can do just that (Willis 1966). The crow could thus actually limit abundance of Ring-billed and/or California gulls in Washington and farther north during the nonbreeding season.

SUMMARY

Four species of birds composing the beach scavenging guild of a Puget Sound beach, Northwestern Crow, Glaucous-winged Gull, Mew Gull and Bonaparte's Gull, separate their foods by responding to the tide cycle in different ways, by feeding in different places in the intertidal, and by choosing foods of different sizes. Differences in food dispersion and in the resulting socialities also indicate the use of different foods. Species in this guild are ecologically equivalent to species in similar guilds in Maine and Europe. Apparently, the Northwestern Crow exploits a typical gull niche, and possibly to the exclusion of a medium-sized gull.

ACKNOWLEDGMENTS

I thank Tim Manolis, Donald Miller, George Hunt, Laurence C. Binford and Lorna Tangren for their comments on the manuscript.

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Accepted 14 November 1979

WESTERN BIRD PHOTOGRAPHERS

A PHOTO ESSAY BY FRANS LANTING

NARCA A. MOORE CRAIG, P.O. Box 374, Lakeview, California 92353

Sparrow in willow tree, Holland, 1976

Often as I glance through a new issue of *Geo* or *Audubon* or *National Wildlife*, a single photo will arrest my attention. Frans Lanting must have taken this one. And usually he did.

Frans' photos are distinctive. Often moody and dramatic, they capture the subtleties of light and flashing wings. Frans will lie on a mudflat, drenched by the advancing tide, in order to photograph Willets or Marbled Godwits from their own height and perspective. He has a high replacement rate for camera equipment, but the results are stunning.

Frans Lanting's photos have won state, national and international awards, including First Prize and Grand Prize in the International Nature Photography Contest in the Netherlands for two years in a row, *Natural History*'s First Prize for Wildlife Photography, and awards in numerous categories in the Califor-

nia Fish and Game Commission's annual competition. He has co-authored a book, *Feathers and Flight*, with David Cavagnaro, which is being published by Graphic Arts Center of Portland, Oregon; Roger Tory Peterson wrote the forward. His work is used by magazines such as *Life*, *Audubon*, *Geo*, *Natural History* and *Oceans*, as well as dozens of publications in Europe.

Born in Rotterdam, Holland, Frans now lives in Santa Cruz, California. His growing eminence as a wildlife photographer is well-deserved, for he pursues his craft with an intense, single-pointed focus. Frans writes, "I had no idea that all of the above was in the future when I made that photo of the sparrow in the willow, but my basic attitude hasn't changed much. I still photograph from the heart. The difference is that I've become much more sophisticated in my understanding of birds. For that I owe a lot to ornithologists the world over."

Frans occasionally teaches photo workshops, either through a university or at a special event, such as the annual Bald Eagle conference in Klamath Falls, Oregon. His workshops cover field work and camouflage, the mechanics of his techniques, special problems in wildlife photography and equipment. (He prefers older model Nikons.)

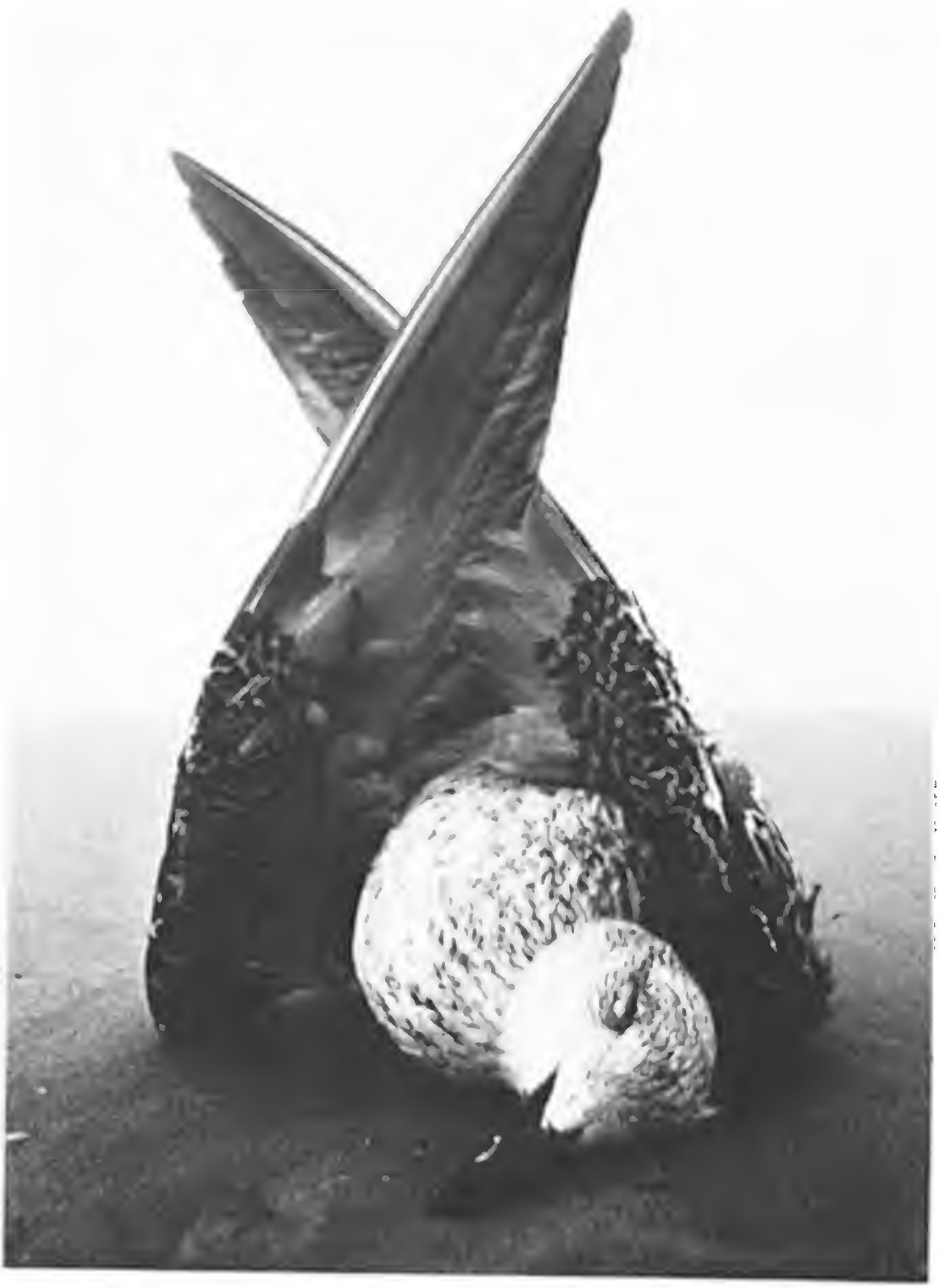
Frans' teaching and art are permeated by a deep understanding of and respect for his subject. To photograph a Bald Eagle, he studied the bird, questioned biologists, found a known eagle perch, packed in his equipment, built a blind—and waited. Three days later, an eagle appeared. By then Frans had used much of his film to photograph the play of light on a gnarled stump opposite the blind. With what remained, he photographed the eagle—superbly, without disturbing the raptor.

His distinctive style is not entirely the result of having mastered technique. Frans' work has depth. He probes all manner of subjects from the death of a gull to the beauty of massed Snow Geese in flight over Tule Lake. He also brings humor to his work. At one workshop a participant, staring pointedly at Frans' boots, asked, "Is it necessary to wear one black boot and one green?"

"No," replied Frans, "but it helps."

This photo essay, and the Tufted Puffin photo which will appear on the cover of Volume 14, Number 1, are samples of Frans' work. If you would like to obtain prints, they are available from Frans Lanting, 714-A Riverside, Santa Cruz, California 95060.

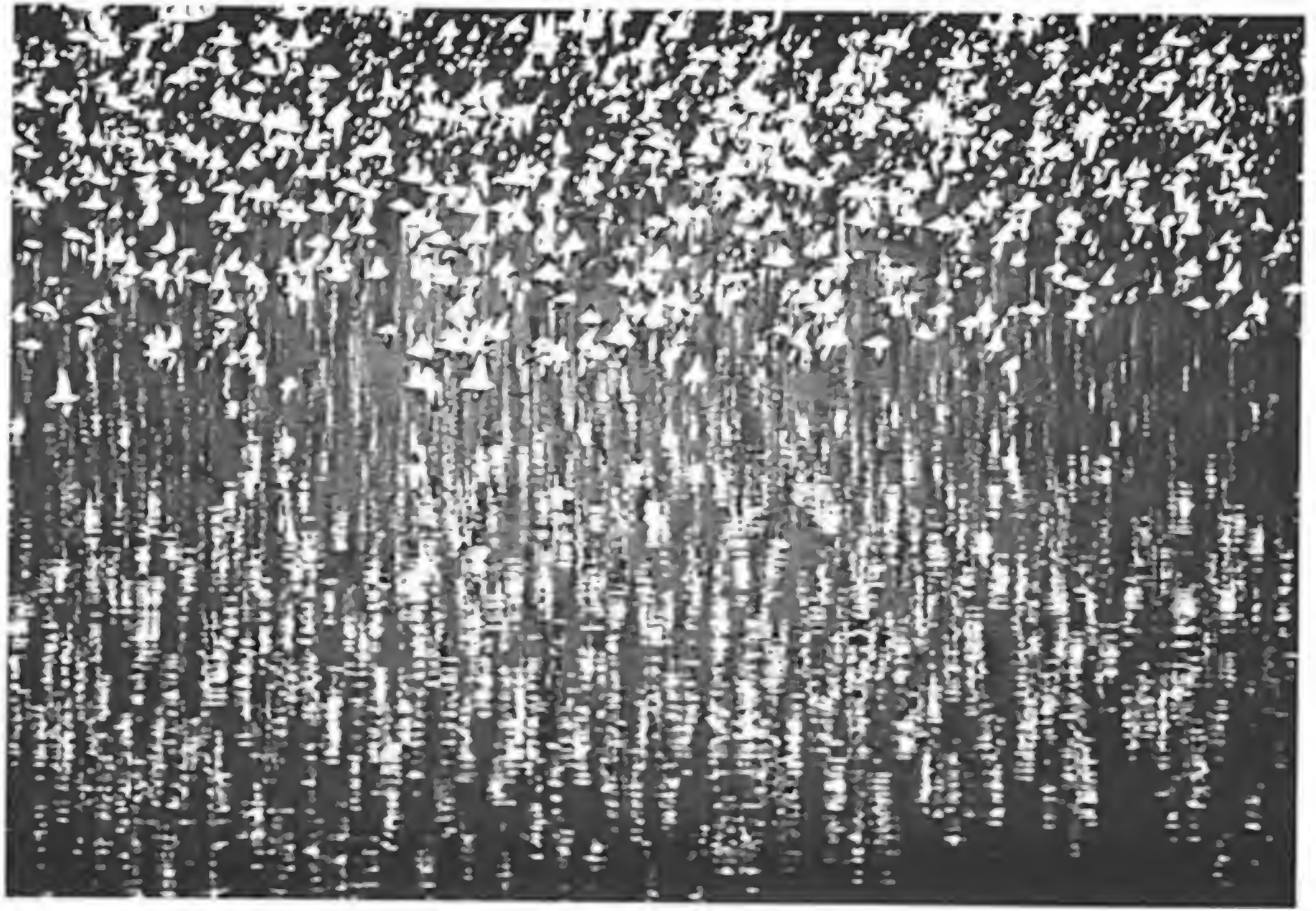
Dead Herring Gull, Maasvlakte, Holland, 1978



Marbled Godwit landing, Laguna San Ignacio, Baja California 1980

Marbled Godwits, Humboldt Bay, California, 1979

Snow Geese landing, Tule Lake, California, 1979



Dunlin in flight, Humboldt Bay, California, 1979

Face of dead gull, San Lorenzo River, 1980

Gulls at dusk, Holland, 1976

White Tern (*Gygis alba*), Hawaiian Leeward Islands, 1982

Western Gull, Año Nuevo Island, California, 1980

Photos © Frans Lanting, 1983

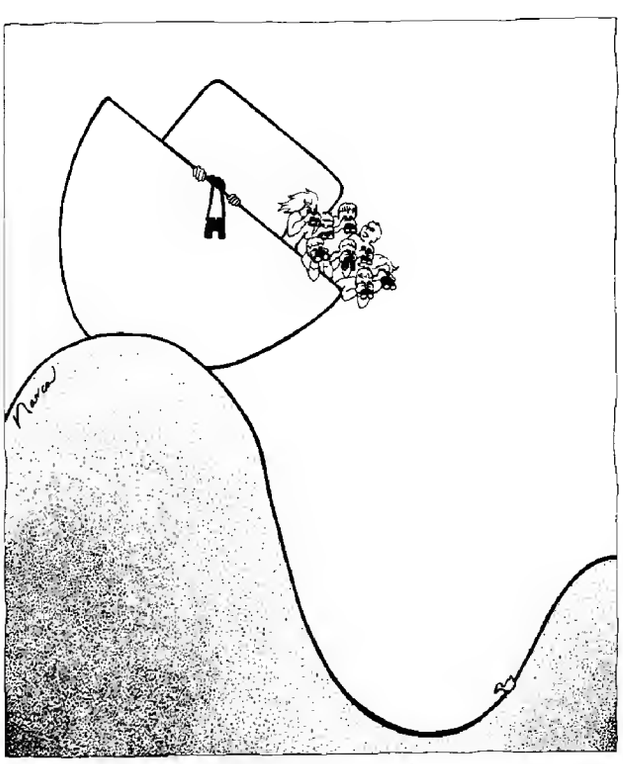
WESTERN FIELD ORNITHOLOGISTS

8th Annual Convention
29 September through 2 October 1983
on Monterey Bay at
SANTA CRUZ, CALIFORNIA

A dynamite weekend of field trips and lectures is planned! Numerous pelagic trips on Monterey Bay will observe the spectacular seabird migration. Owling and land trips are planned to a variety of habitats. Lectures and a dinner banquet are planned for Saturday, October 1.

REGISTRATION: WFO members and their families, $25 per person. Non-members, $39 per person (includes one-year membership and subscription to *Western Birds*)

CONTACT: Debra Love Shearwater, P.O. Box 7440, Santa Cruz, CA 95061. Telephone 408-425-8111.



"Hey! Bruce..."

FURTHER RECORDS OF WHITE-THROATED SWIFTS UTILIZING MAN-MADE STRUCTURES

CHARLES T. COLLINS, Department of Biology, California State University, Long Beach, California 90840

ERIC V. JOHNSON, Biological Sciences Department, California Polytechnic State University, San Luis Obispo, California 93407

The White-throated Swift, *Aeronautes saxatalis*, occurs widely in western North America utilizing narrow crevices in rock cliffs, from sea level to 13,000 feet, for both nesting and roosting sites (Bent 1940:311). These swifts have on several occasions been noted using man-made structures for these activities (Bailey 1907, Skinner 1933, Pitelka 1944, Yocom 1966, DeSante and Perrone 1968). We present here additional observations of these swifts utilizing man-made structures in southern California.

For several years White-throated Swifts have been observed flying around many of the older buildings in the downtown section of Riverside, Riverside Co., California (P. Romero pers. comm.). On 1 October 1978 Collins saw approximately 125 swifts going to roost in the deserted First Baptist Church on the corner of 9th and Lemon streets. Between 11 October 1978 and 6 July 1979 he made an additional 20 trips to observe the evening roosting or morning arousal of these swifts. The principal entrances to the roosting sites were the topmost louver in the church tower and the louvered window near the roof peak (Figure 1). The tower was utilized by 10-25 birds with the rest entering through the window. When examined from the inside in April, the louvered window was found to be screened on the inside; the birds were going up through a crack in the upper part of the window frame into the space between the inner and outer walls of the church. A few swifts also roosted in small openings behind the metal flashing at the top of the church tower.

During April 1979 swifts were seen briefly entering openings in other buildings in the downtown area; the brevity of these trips suggested they were prospecting for nest sites. Aerial copulations were observed on 8 April and young swifts were being fed in the church tower on 4 July 1979. The swifts were observed roosting in the same localities when the site was revisited in November 1981. From these observations it seems clear that White-throated Swifts were using the church throughout the year for both roosting and nesting.

In late May 1979 D. Thompson (pers. comm.) noted a flock of perhaps 15-20 White-throated Swifts frequenting the end of the Port San Luis Harbor District Pier, San Luis Obispo Co., California. The swifts were observed in late evening entering cracks between the rafters of the roofed end of the pier. Subsequently Johnson checked the site periodically between July 1979 and October 1981 in all seasons. Adult activity and the begging calls of nestlings suggested that the site was being utilized both as a winter roost and nesting area. At least six individuals were present in the winter months and three ac-

tive nests were noted. The success rate of these nests could not be determined.

The pier is approximately 400 yards long and unroofed for most of its length. The ocean end has a restaurant, cocktail lounge, fish market, and parking area all covered by a high wooden roof (Figure 2a). The flooring of the pier is approximately 15 feet above water level and the nest sites in the rafters are about 25 feet above the pier floor. The sites are formed by the junction of the two 2 × 8 inch rafters which run parallel at the angle between the flat roof and its pitched sides (Figure 2b). By our estimates, there are 7-10 usable situations where the rafters meet at the ends but are bowed at the middle allowing the birds to enter and travel to either end. The active swift nests were located only at those sites where much grass and string was noted hanging through the crack between the rafters. We surmise that the swifts were using old House Finch, *Carpodacus mexicanus*, nests as bases for their own; four to six pairs of House Finches were using other sites in the rafters not occupied by the swifts.

These nest sites do not appear to be particularly safe since the wings of two dead swifts and at least three eggs could be seen protruding from the cracks between the rafters. The House Finch nests seemed to be composed largely of string, and probably fish line, in which the dead swifts apparently had become entangled. The eggs had fallen over the edge of the nests, possibly due to the struggles of the entrapped swifts. Similar entanglements have been reported for House Swifts, *Apus affinis*, in southeast Asia (Dickinson 1966, Kapoor 1965).

Figure 1. First Baptist Church, Riverside, California, which was utilized by nesting and roosting White-throated Swifts.

Although not widely reported, it now seems clear that at least some White-throated Swifts are as opportunistic in their choice of nesting and roosting sites as the several other species of swifts that regularly utilize man-made structures (Lack 1956). Human activity around both sites was high but did not seem to disturb the swifts. The Riverside site is in a busy part of town and adjacent to an active construction site for a new nine-story building. The Port San Luis Pier is used daily by fishermen, and there is frequent truck and automobile traffic immediately below the nest sites; a live rock band plays in the cocktail lounge four evenings a week. In the cases documented here, as well as those observed by Yocom (1966), the swifts were using structures at substantial distances from suitable natural nesting or roosting sites. The choice of such nest/roost sites presumably has allowed them to utilize foraging ranges and food resources otherwise unavailable to White-throated Swifts despite their great mobility.

ACKNOWLEDGMENTS

Paul D. Romero and David H. Thompson called our attention to the swifts at Riverside and Port San Luis respectively. Joseph Pitruzzello made possible access to the interior of the church. To these people we offer our personal thanks.

Figure 2. Port San Luis Harbor District Pier: a-roofed end of pier; b-White-throated Swift nest site between pier roof rafters.

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Accepted 4 September 1982

Note added in press: The First Baptist Church of Riverside was destroyed by fire on 19 September 1982. — *CTC*

White-throated Swifts *Sketch by Narca Moore*

VOCAL COPYING IN LAWRENCE'S AND LESSER GOLDFINCHES

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RICHARD A. ERICKSON, P.O. Box 657, Klamath, California 95548

With perhaps the exception of the Northern Mockingbird, no bird in the western United States copies the vocalizations of such a wide variety of bird species with such proficiency as the Lawrence's Goldfinch. Although this vocal "mimicry" was long ago described by Dawson (1923), subsequent workers have apparently failed to notice this striking feature of Lawrence's Goldfinch vocalizations. Linsdale (1968) cited numerous references concerning descriptions of the song, none of which mentioned imitation. Coutlee (1971) studied in detail the vocalizations of this species, yet did not realize that the elaborate song is composed primarily of notes copied from other birds' vocalizations. Concerning the vocalizations of this species, Lesser Goldfinch, and American Goldfinch, Coutlee (1971:561) stated "these...are probably among the longest and most varied of passerine songs (excluding, of course, birds which mimic other songs)." Lawrence's Goldfinch was not included in Dobkin's (1979) extensive list of birds known to copy other species.

From 1973 to 1980 we made notes on the composition of songs of individual Lawrence's and Lesser goldfinches with respect to species imitated. Our field experience has involved birds on the wintering grounds as well as breeding birds, and has spanned most of the range of Lawrence's Goldfinch and much of the northern and western range of Lesser Goldfinch. We have no tape-recordings to document our case for interspecific copying, but we feel secure in our contentions in that the imitations are very obvious to anyone familiar with the vocalizations of California birds.

The cadence, frequency and duration of Lawrence's Goldfinch song is well described by Coutlee (1971). However, most, if not all, notes comprising the song are obvious imitations of call notes of other species. In Table 1 we present a list of all bird species (plus one frog) whose calls we have recognized in Lawrence's and Lesser goldfinch songs. We are not certain if the Lawrence's Goldfinch has notes or phrases within its song that are truly its own, except for its characteristic flight call, which is frequently used as a note in the song.

Species whose vocalizations are incorporated most frequently into Lawrence's Goldfinch song are those with loud, distinctive or simple calls. These vocalizations are usually prominent sounds in goldfinch habitat. No other correlates, taxonomic or ecological, can be discerned from the list of species copied. Many of the species from Table 1 are also frequently imitated by the Northern Mockingbird and the European Starling (*Sturnus vulgaris*) (pers. obs.), the two other species in California most noted for their vocal copying.

The quality of Lawrence's Goldfinch vocal appropriations is such that individual appropriated calls, if given by themselves, would be virtually indistinguishable from model species, although sound spectrograms of course might reveal stronger differences. The precision of imitation is such that calls of closely-related, similar-sounding species/subspecies can be clearly distinguished, e.g. "Audubon's" from "Myrtle" Warbler and Hairy from Downy Woodpecker.

Vocal copying in the Lawrence's Goldfinch falls into Dobkin's (1979) category of "vocal appropriation." We feel that it is highly unlikely that the copied vocalizations function in interspecific contexts, i.e., either "vocal mimicry" or "vocal convergence or non-divergence" (*sensu* Dobkin). Since Lawrence's Goldfinch frequently copies the flight calls of all three North American congeners, "vocal convergence" is possible but evidence is lacking.

Although we have no convincing explanation for the function of vocal appropriation in the Lawrence's Goldfinch, we argue that it almost certainly has nothing to do with negative effects on model species, i.e., exclusion of competitors, as proposed by Cody (1974:248) for vocal copying by the Northern Mockingbird and European Starling. This explanation is unsatifactory for such cases of vocal copying for three reasons: (1) the ecological range of species copied is extremely broad, with no tendencies for favoring potential close competitors; (2) since most copied vocalizations are calls or song segments rather than complete songs, it is unclear what effect these would have on target species—attraction because of territorial aggression or "curiosity" is perhaps more likely than repulsion; and (3) European Starlings (and goldfinches) have type "B" territories used primarily for nesting rather than feeding and thus models should be limited to nest-site competitors. (They are not.) Furthermore, in the case of the goldfinches, vocal copying is prominent among non-breeding, presumably non-territorial, winter birds. Mainly for lack of plausible alternatives, we favor an explanation concerning an expansion of repertoire size as an index of fitness (Howard 1974).

Much of what we say concerning vocal appropriations in the Lawrence's Goldfinch also applies to the Lesser Goldfinch. Vocal copying in the Lesser Goldfinch was also described by Dawson (1923); in Table 1 we list species whose vocalizations we have heard "appropriated" by Lesser Goldfinches. Most differences in model species between the two goldfinches are due to slight differences in their habitat preferences, with Lesser Goldfinch favoring more mesic areas. The Lesser Goldfinch occupies a rather wide geographical range, and the species copied vary with locality. An individual at Sarita, Kleberg Co., Texas, faithfully copied the "wee-bee" song segment of the Eastern Phoebe (*Sayornis phoebe*, 6 May 1980); we have never heard this species copied in California (where it is rare visitor). A Lesser Goldfinch at Patagonia, Santa Cruz Co., Arizona, incorporated the calls of the Gila Woodpecker (*Melanerpes uropygialis*, 26 June 1976) into its song; the Gila Woodpecker does not occur in most of the California range of the Lesser Goldfinch, and we have not heard it copied in that state. This geographical variation further suggests the importance of prominent environmental sounds as incorporated elements in the song of the Lesser Goldfinch. The

Table 1. Species whose vocalizations are copied by Lawrence's and/or Lesser goldfinches.

	Lawrence's	Lesser
American Kestrel (*Falco sparverius*)	X[1]	X
California Quail (*Callipepla californica*)	X	
Gambel's Quail (*Callipepla gambelii*)	X	
Killdeer (*Charadrius vociferus*)	X	X
Spotted Sandpiper (*Actitis macularia*)	X	
Greater Yellowlegs (*Tringa melanoleuca*)	X	
Northern Flicker (*Colaptes auratus*)	X	X[1]
Acorn Woodpecker (*Melanerpes formicivorus*)	X	
Hairy Woodpecker (*Picoides villosus*)	X[3]	X
Downy Woodpecker (*Picoides pubescens*)		X
Ladder-backed Woodpecker (*Picoides scalaris*)	X[3]	X
Nuttall's Woodpecker (*Picoides nuttallii*)	X	
Western Kingbird (*Tyrannus verticalis*)	X	
Cassin's Kingbird (*Tyrannus vociferans*)	X	
Ash-throated Flycatcher (*Myiarchus cinerascens*)	X	X
Black Phoebe (*Sayornis nigricans*)	X	X
Western Wood-Pewee (*Contopus sordidulus*)	X[1]	X[1]
Western Flycatcher (*Empidonax difficilis*)		X
Violet-green Swallow (*Tachycineta thalassina*)	X	X
Barn Swallow (*Hirundo rustica*)	X	
Scrub Jay (*Aphelocoma coerulescens*)	X	
Plain Titmouse (*Parus inornatus*)	X[2]	X[1,2]
Verdin (*Auriparus flaviceps*)	X[2]	X
White-breasted Nuthatch (*Sitta carolinensis*)	X	X
Bewick's Wren (*Thryomanes bewickii*)	X[2]	X
House Wren (*Troglodytes aedon*)	X	X
Rock Wren (*Salpinctes obsoletus*)	X[1,2]	X
Canyon Wren (*Catherpes mexicanus*)	X	
Northern Mockingbird (*Mimus polyglottos*)	X	
American Robin (*Turdus migratorius*)	X[1]	X[1]
Hermit Thrush (*Catharus guttatus*)	X	X
Western Bluebird (*Sialia mexicana*)	X[1]	X[1]
Blue-gray Gnatcatcher (*Polioptila caerulea*)	X	X
Ruby-crowned Kinglet (*Regulus calendula*)	X	
Water Pipit (*Anthus spinoletta*)	X	
Cedar Waxwing (*Bombycilla cedrorum*)	X	
Phainopepla (*Phainopepla nitens*)	X	X
Solitary Vireo (*Vireo solitarius*)	X	
Yellow-rumped Warbler (Myrtle) (*Dendroica c. coronata*)		X

Table 1 (Cont.)

	Lawrence's	Lesser
Yellow-rumped Warbler (Audubon's) (*D. c. auduboni*)	X	X
Western Meadowlark (*Sturnella neglecta*)	X	
Northern Oriole (Bullock's) (*Icterus galbula*)	X	
Brown-headed Cowbird (*Molothrus ater*)	X	
House Sparrow (*Passer domesticus*)		X[1]
House Finch (*Carpodacus mexicanus*)	X[2]	X[1,2]
Pine Siskin (*Carduelis pinus*)	X	X
American Goldfinch (*Carduelis tristis*)	X	X[1]
Lesser Goldfinch (*Carduelis psaltria*)	X[1]	
Lawrence's Goldfinch (*Carduelis lawrencei*)		X
Brown Towhee (*Pipilo fuscus*)	X	X
Rufous-crowned Sparrow (*Aimophila ruficeps*)	X	X
Dark-eyed Junco (*Junco hyemalis*)		X
Pacific Treefrog (*Hyla regilla*)	X	

[1]Heard in over 50% of individuals
[2]Song segments appropriated as well as calls
[3]Two or more types of calls appropriated

Note: This table is based on field experience of the authors with approximately 30 individual *C. lawrencei* and 25 *C. psaltria*; about 60% of the individuals of both species were non-breeding birds on their wintering grounds. See Dawson (1923) for an additional listing of species imitated.

major difference between imitations made by Lesser and Lawrence's goldfinches is that in the Lesser Goldfinch, a lower percentage of song syllables can be readily identified as appropriated from other species, with many song sequences devoid of any appropriated material.

We have never heard the other two California members of the genus, American Goldfinch and Pine Siskin, copy other species, despite their proficiency at intraspecific imitation (Mundinger 1979). The rambling song of the Pine Siskin is quite similar in form to that of the Lawrence's and Lesser goldfinches, but appears to contain no appropriated material, containing instead a variety of Pine Siskin call notes. The form and quality of American Goldfinch vocalizations are quite distinct from those of North American congeners, and apparently do not contain appropriated material.

We thank John W. Hardy, Theodore A. Parker, III, Thomas S. Schulenberg and Peter Stettenheim for helpful comments on the manuscript.

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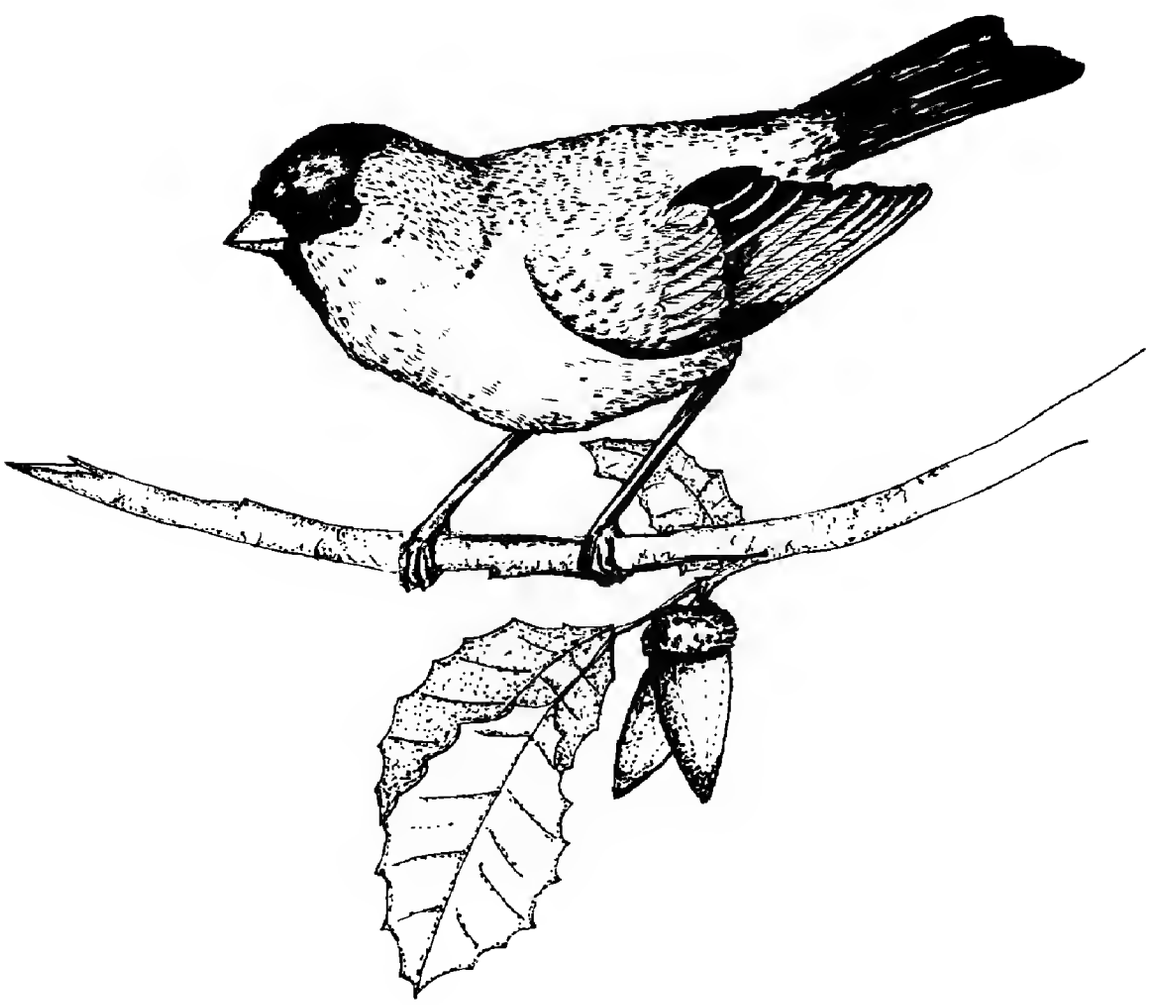
Accepted 19 August 1981



Lawrence's Goldfinch *Sketch by Cameron Barrows*

TREASURER'S REPORT

WESTERN FIELD ORNITHOLOGISTS, INC.

Cash Flow Statement for 1 January 1981 to 31 December 1981

Cash on hand, 1 January 1981		$ 8,757.61
Gibraltar Savings & Loan (savings)	$ 5,291.48	
Bank of America (checking)	3,466.13	
RECEIPTS		
Membership	$ 3,588.43	
Boat Trips	3,115.00	
Back Issues	379.63	
Reprints	28.30	
Interest	303.42	
Advertising	60.00	
Miscellaneous	27.75	7,502.53
		$ 16,260.14
DISBURSEMENTS		
Western Birds	$ 4,989.72	
Boat Trips	2,600.00	
Membership/Business Services (1)	1,027.58	
Postage	350.72	
Miscellaneous	43.70	9,011.72
Cash on hand, 31 December 1981		$ 7,248.42
Gibraltar Savings & Loan (savings)	$ 5,594.90	
Bank of America (checking)	1,653.52	

(Prepared without audit)

J. Garth Alton, *Treasurer*

(1) Includes Business Services Honorarium.

NOTES

SOUTHERNMOST NESTING RECORD FOR THE MOUNTAIN BLUEBIRD

JANE P. CHURCH, Box 38, Sonoita, Arizona 85637

In mid-March 1981 33 bluebird boxes were erected 3 to 5 km south of Sonoita, Santa Cruz Co., Arizona, in oak-juniper grassland habitat at approximately 1540 m. On 11 May I found four just-hatched Mountain Bluebirds (*Sialia currucoides*) and one egg. Both parents were carefully observed at close range, appeared in excellent physical condition, and showed no signs of hybridization with either Eastern (*S. sialis*) or Western (*S. mexicana*) bluebirds; both species occur in the area, the Eastern commonly nearby and the Western in lesser numbers primarily in the Santa Rita Mountains, about 20 km west, and the Huachuca Mountains, about 25 km east. On 26 May I returned with Max C. Thompson who confirmed the identification and assisted in banding five well-feathered young which immediately left the box and hopped and fluttered toward a nearby tree. We put them back, apparently successfully, as none was seen to exit and both adults brought food for the next half hour. Neither the young nor the parents were seen again but no specific search was made for them. Eastern Bluebirds occupied the box in June and produced three young in July. Gale Monson (in litt.) confirmed this as the southernmost nesting record of the Mountain Bluebird, whose nearest known nests in Arizona are approximately 240 km to the north. It winters regularly in the Sonoita area in small flocks.

I am grateful to Thorne W. Pierce of Tucson, who made and donated the boxes; to the Board of Directors of the Sulphur Springs Valley Electric Cooperative, Inc., who gave permission to erect 25 boxes on their poles; to the scouts of Patagonia Troop 543, who stained and helped erect the boxes; to Robert Woodroof of the cooperative, who assisted the scouts and put up many boxes; to Sue Hey on whose property the nesting occurred; to Gale Monson for his confirmation; and to Gary C. Bateman for his comments on this note.

Accepted 1 October 1982

PALM WARBLER OBSERVATIONS IN IDAHO

DANIEL M. TAYLOR, Biology Dept., Idaho State University, Pocatello, Idaho 83209

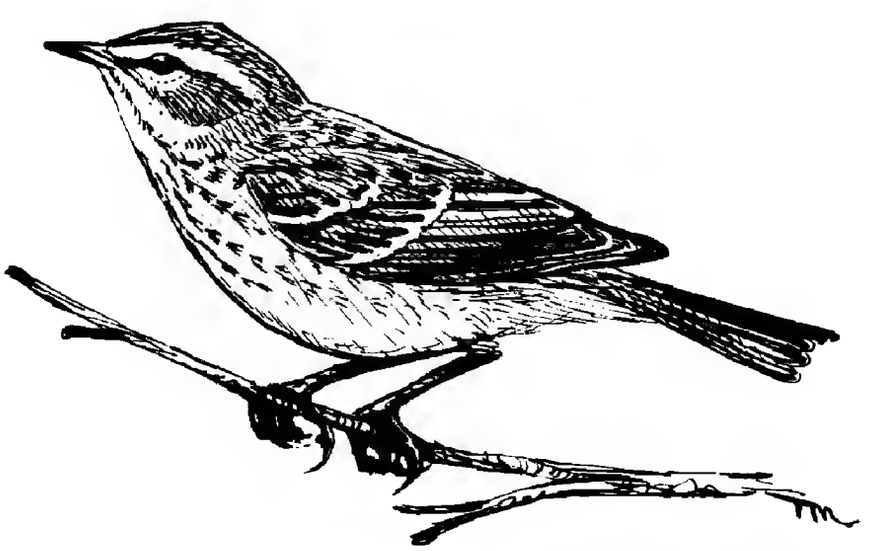
On the morning of 20 September 1981 Rolf Koford and I saw a Palm Warbler (*Dendroica palmarum*) in the tiny desert town of Atomic City, Bingham County, southeast Idaho. It was first discovered in a yard, feeding on the ground and in some small bushes. We watched the bird for 2 minutes through binoculars at a distance of about 15 m, before it flew off with a flock of Yellow-rumped Warblers (*Dendroica coronata*). Later the same morning we relocated a Palm Warbler, very likely the same bird, in another yard where it was also seen by Mark Reynolds.

This Palm Warbler's most evident field mark was the distinct yellow undertail coverts, made obvious by the bird's habit of tail-wagging. The general body color was dull brown, but lighter ventrally. There were faint wing bars, a light eye stripe, and a small amount of white in the tail feathers. My familiarity from banding and studying this species in the field in other parts of the country facilitated recognition.

Neither Burleigh (Birds of Idaho, Caxton Press, Caldwell, Idaho, 1972) nor Larrison et al. (A guide to Idaho birds, J. Idaho Acad. Sci., Vol. 5, 1967) reported the Palm Warbler as occurring in Idaho. To my knowledge the only previous records for the state were two from fall, 1979. Joe Jeppson banded and photographed an immature bird on 9 September, and Charles H. Trost saw an individual on 18 October. Both of these observations were from Pocatello (Rogers, Am. Birds 34:184, 1980). On the basis of these records, this warbler should be considered a rare fall migrant in southeast Idaho.

I would like to thank Dr. Charles H. Trost for his help in writing this note.

Accepted 4 September 1982



Palm Warbler *Sketch by Tim Manolis*

AN EXTANT SPECIMEN OF ARCTIC TERN FROM COLORADO

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BRUCE E. WEBB, Department of Environmental, Population and Organismic Biology, University of Colorado, Boulder, Colorado 80309

During a recent examination of tern specimens at the University of Colorado Museum, Boulder, Bruce Webb and Peter Moulton found that CU specimen 8108, labelled Common Tern (*Sterna hirundo*), was an immature Arctic Tern (*S. paradisaea*). It was one of two terns collected from a flock of "a dozen or more" feeding at a small lake near Windsor, Weld County, Colorado, on 16 September 1912 by Osterhout (1913).

The initial reidentification of CU 8108 was based on a 14.1 mm. tarsal measurement. According to Ridgway (1919), tarsus length of *paradisaea* ranges from 13.5 to 16.0 mm whereas that of *hirundo* ranges from 17.5 to 20.5 mm (ranges of sexes combined). The diagnostic primary pattern of the Arctic Tern, described by Roxie C. Laybourne (in Burleigh 1973), is that the second outermost primary tip is gray from the tip inward about 25 to 32 mm, whereas in the Common Tern it is dark gray inward from the tip about 37 to 60 mm. The dark tip of the second outermost primary of CU 8108 is shorter and narrower than that of a Common Tern (Figure 1). At our request, Allan R. Phillips measured CU 8108 and provided the following: tarsi 14.1 mm;

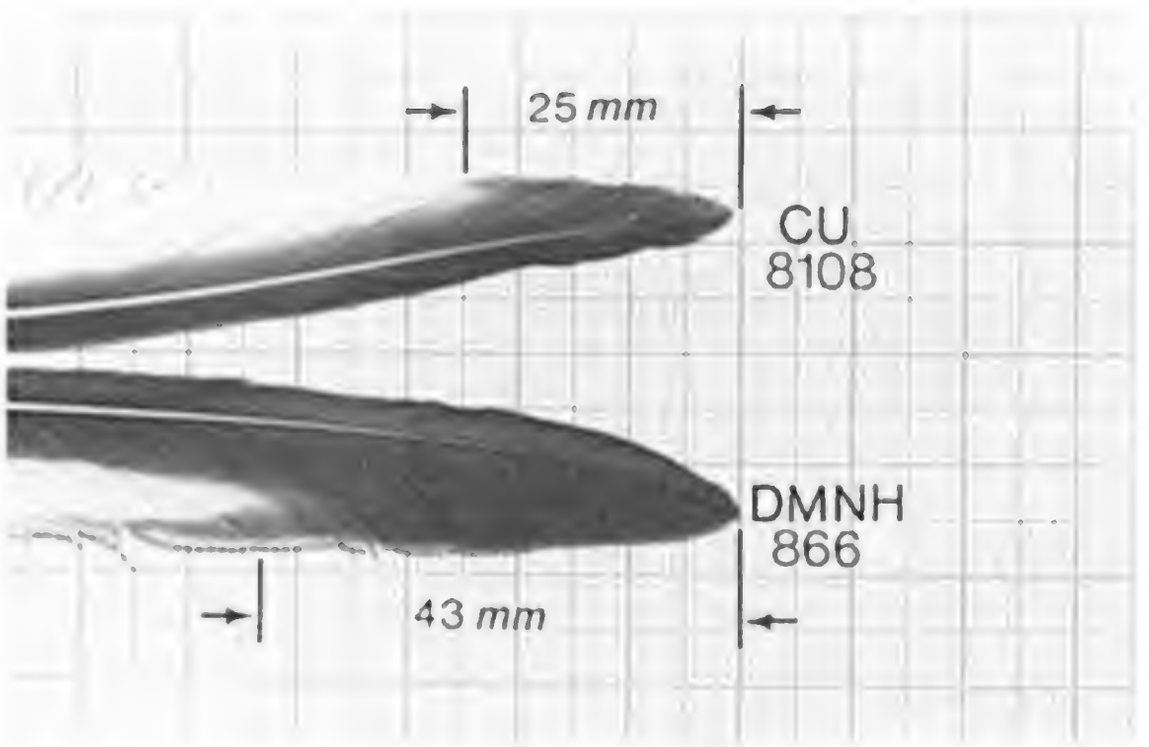

Figure 1. Second outermost primary of Arctic Tern (*Sterna paradisaea*; University of Colorado Museum 8108) and Common Tern (*S. hirundo*: Denver Museum of Natural History 866). Note the narrower primary width and less extensively dark tip of the Arctic Tern. The reduced pigmentation of Arctic Tern primaries results in their greater translucency and narrower dark trailing edges.

exposed culmen 26.5 mm; bill depth (at anterior edge of nostril) 6.3 mm; wing chord (both) 237 mm, no sheathing; tail 115.7 mm. These measurements, plus comparisons with Arctic and Common tern specimens at the Denver Museum of Natural History, confirmed the reidentification.

Phillips and we examined all other Colorado Common Tern specimens at these two museums, and particularly Osterhout's other collected tern, and found them to be correctly identified. The location of the two pre-1900 Colorado Arctic Tern specimens cited by Bailey and Niedrach (1965) is still unknown. For this reason, the Colorado Field Ornithologists Official Records Committee ruled that Arctic Tern should be dropped from the Colorado list due to insufficient or unconvincing details (Reddall 1976). These two records presumably were the basis for listing Arctic Tern as "accidental in Colorado (near Denver)" in the AOU Check-list (1957). As with the Idaho specimen record (Burleigh 1973) and two Arizona specimen records (Monson and Russell 1975), this addition to the Colorado list involved an immature bird, originally mislabeled as a Common Tern, collected within the early September to early October period of fall migration.

We gratefully acknowledge Allan R. Phillips for his critical examination of the specimen. We give special thanks to Betsy Webb, curator of Zoological Collections at the Denver Museum of Natural History, and Shi-Kuei Wu, University of Colorado Museum, Boulder, for making available specimens for comparison.

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Accepted 22 June 1982

NESTING OF WATER PIPITS IN SEQUOIA AND KINGS CANYON NATIONAL PARKS

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RANDY MORGENSON, Sierra District, Sequoia and Kings Canyon National Parks, Three Rivers, California 93271

Within recent years, several observations of the Water Pipit *(Anthus spinoletta)*, adults and young, have been made in Sequoia and Kings Canyon National Parks; most of these observations occurred in the Upper Kern Basin. Prior to 1975, Water Pipits were not known to nest in California (Am. Birds 29:1028, 1975). On 1 August 1975, a Water Pipit nest was discovered at 3200 m in the central Sierra near Mount Conness (Gaines, Birds of the Yosemite Sierra, 1977:101). Subsequent nesting has been documented in the area.

On 25 July 1975, Morgenson, a backcountry ranger, observed an adult Water Pipit feeding two young at Lower Hitchcock Lake, 3 km southwest of Mount Whitney at an elevation of 3555 m. Morgenson stated on the field observation form that the immature pipits were "obviously born . . . in the high Sierra—evidence that these pipits nest here."

Five years later, on 8 August 1980, Morgenson observed a downy young Water Pipit near Shepherd Pass (3600 m) in the Upper Kern Basin. The immature pipit could not fly, but walked about on the ground. An adult bird stayed nearby or fluttered overhead during the observation period. Later that same summer, on 22 August 1980, Morgenson sighted another immature Water Pipit in Miter Basin, northwest of Mount Langley. The bird was "observed for several minutes at about 20 m before it flew."

At 1610 on 17 July 1981 in Center Basin (3555 m), Kings Canyon National Park, Norris observed a pair of Water Pipits foraging on the mud and pebble shore of a little snow-melt lake. One held insects in its bill. Searching for possible nests, Norris flushed one young pipit from near the shore. The young bird had a short tail, with white on the sides; its back was brown. One adult pipit (parent?) began short, sharp calls as it took wing and flew over him twice at about 3 m above the ground.

The young Water Pipit then flew in a low, direct flight across the lake inlet and into some nearby willows. The two adult pipits flew over Norris to the willows, and without landing, flew back over to their original position on the grassy hummocks near the lake shore. During this time, the two birds kept repeating the sharp "pink" note at regular intervals.

About 10 minutes later, one adult pipit took a billful of insects to the willows where the young pipit was last seen. Norris could not see the birds at this point but could hear the incessant begging call of the young pipit. The adult then flew from the willows to light upon a boulder. From his angle of view, Norris could not see if the insects were gone from the adult's bill.

Eight minutes later Norris walked over to the willows and flushed the young Water Pipit. It flew up onto the nearby talus, perched on a boulder, and bobbed its short tail up and down; the bird continuously called and kept watching him. The same adult pipit attempted to bring food to the young in the willows but could not locate it. The two birds did not meet, and the adult eventually flew back across the inlet.

While on patrol the morning of 2 July 1982, Morgenson discovered a Water Pipit nest 1.5 km west of Shepherd Pass in the Upper Kern Basin at an altitude of 3570 m. The habitat was rocky ground on a slight rise near a stream with stringer meadows. Morgenson's report describes the discovery: "Walking toward the pass, I startled an adult Water Pipit from a place between the halves of a frost-riven rock. On the ground, between the halves of rock, was a grass nest with five dark-brown eggs in it. The adult

pipit circled overhead for a couple of minutes then began to fly away, so I left without taking time for photographs. The bird was continuously peeping the unmistakable call of a Water Pipit while flying overhead. The white outside tail feathers, the size of the bird, the shape of the bill, and the brown color assisted in identification."

As far as we can determine, this is the first nesting record of the Water Pipit for the west slope of the Sierra and the first for the parks. Water Pipits in the southern Sierra inhabit the grass hummock meadows and exposed gravel shorelines around alpine lakes near the crest of the range. This habitat is common in the high country. The Water Pipit is one of the most common passerines on the alpine fell-fields of the southern Sierra Nevada during the summer. The lack of field observations of Water Pipits in the southern Sierra in the past has had little to do with the scarcity of the bird, but is more a result of few knowledgeable birders in the high country during the pipit's nesting season.

Accepted 22 September 1982

NOCTURNAL FORAGING OF THE ROCK WREN UNDER ARTIFICIAL ILLUMINATION

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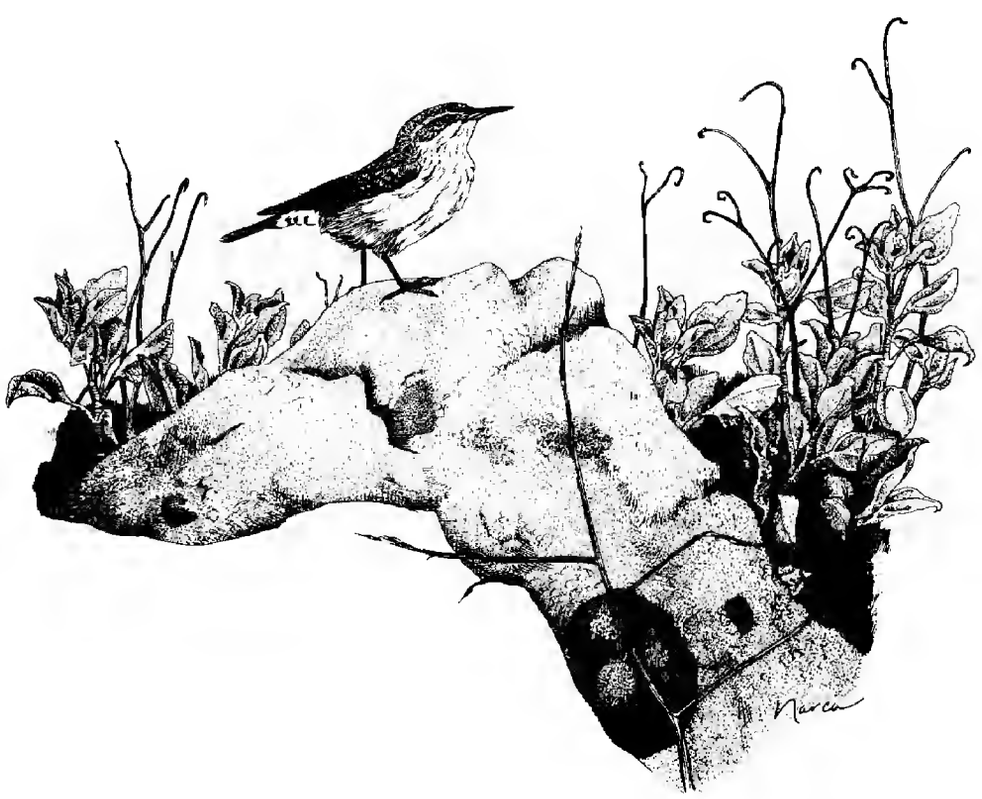
Shortly after midnight on the morning of 8 August 1980 at the Sunset Roadside Rest Area along Interstate Highway 17 between Phoenix and Flagstaff, Arizona (in Yavapai County), I observed a Rock Wren (*Salpinctes obsoletus*) feeding in an artificially lighted area. The wren was moving about on the ground near a building and was relatively tame, allowing me to stand about 20 feet away as it captured a moth fluttering on the ground. Several dead moths on the ground had apparently been attracted to the light on an outside building wall. The Rock Wren grabbed the live moth with its bill, shook it and beat it on the ground a few times and then swallowed it. While I watched the bird for a few minutes it captured and ate about six live moths in this manner. In two cases the bird flew to a nearby low retaining wall where it beat the moths before swallowing them. I observed this feeding activity until the bird was scared away by the passage of another person.

There are apparently few published examples of passerine birds feeding at night, even under artificial illumination (Broun, Auk 88:924-925, 1971; Sick and Teixeira, Auk 98:191-192, 1981). The observation reported here is yet another example of a species' ability to take advantage of locally abundant and easily obtained food, and one of but a few examples of the use of artificial illumination to extend the time available for foraging.

Accepted 12 May 1982



Rock Wren *Sketch by Narca Moore*

PRESIDENT'S MESSAGE

Greetings,

The seventh annual meeting of Western Field Ornithologists in San Diego, 9-12 September 1982, was very informative, enjoyable and productive. Credit and thanks to Elizabeth Copper and Sarah Brooks and all those on the local committee, to Dr. Richard Phillips and the Environmental Studies Program at USD, and to San Diego Field Ornithologists. Many other people, from masters of ceremonies, to field trip leaders and post-banquet speaker Ken Fink who dazzled us with outstanding slides of Alaskan wildlife, made the meeting a real success. About 140 persons from over the U.S. and Canada attended.

Papers and presentations covered birds of San Diego County, Lark Buntings breeding in desert shrub, Yellow-footed Gulls, California Least Terns, vocalizations of Lesser Goldfinches, raptors of San Diego County, woodpecker feeding ecology, marshland stability, pelagic birds, bird photography, field identification challenges, and wildlife films. Field trips to the Salton Sea, the San Diego vicinity and offshore to San Clemente Island upheld the area's reputation for great birds and thorough birding effort, with species lists ranging through Salton Sea specialties, to Red-faced Warbler and Painted Bunting, and to Red-billed Tropicbird, Buller's Shearwater, South Polar Skua and Sperm Whale!

Actions taken by the Directors included increasing dues of Regular Memberships to $14, a decision overdue and necessary to maintain WFO's financial capability. This was in conjunction with a decision to publish 5 issues of *Western Birds* in 1983: Volume 13, which will consist of one issue (Number 1-4), and Volume 14 which will include four issues (Numbers 1 through 4). This action will bring *Western Birds* to date, provide the opportunity for more publications and give subscribers five issues instead of four within the year.

Other decisions relative to improving the efficiency of WFO's organization and facilitating publication of the journal included some rearrangement of duties of officers and of people assisting with publication of *Western Birds*. The officers for the coming year are Terry Wahl (President), Laurie Binford (Vice-president), Garth Alton (Treasurer and Membership Secretary) and Jean-Marie Spoelman (Recording Secretary). Sarah Brooks was appointed chairperson of the Membership Promotion Committee and will be assisted by Ginger Johnson. Changes and additions relative to *Western Birds* are Elizabeth Copper (Circulation Manager), Don Roberson (Photo Editor), and Cameron Barrows (Associate Editor). Of course Alan Craig and Narca Moore-Craig continue in their positions as Editor and Associate Editor, respectively. The Identification Committee, headed by Tim Manolis and assisted by Bruce Webb, seeks manuscripts on identification of birds in western North America.

Our 1983 annual meeting will be held in Santa Cruz, California, from 29 September to 3 October. Debbie Shearwater promises seabirds, shorebirds and landbirds in migration, with exciting possibilities indeed. More details will be coming later, but mark your calendar and plan to see us in Santa Cruz.

—Terence Wahl

IDENTIFICATION QUIZ

What important clues do we have to identify this—or any other—raptor to species? The three most important characteristics to note on a flying raptor are silhouette, flight mannerisms, and plumage pattern. Size is relative and not useful in identifying many birds, including the one in this photograph. Color can be useful but is not so here or, often, in the field. Complicating evaluation of silhouette and flight mannerisms are other factors such as environmental conditions, social and foraging behavior, and molt. For example, the relatively rounded wing tips of buteos or accipiters can appear pointed and falcon-like when a bird is sailing along a windy ridge or diving. Conversely, some pointed-winged raptors, such as falcons, often appear blunter-winged than usual when soaring on thermals. Compounding identification of our bird is the fact that the outer primaries are growing, thus giving the wing tip a rounder shape than usual.

Given that the primaries are growing, our first impression of the bird in this photograph is a deceptive one. Soaring with widely spread wings and tail, the

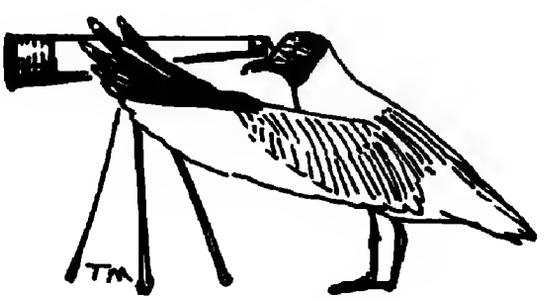
bird presents a silhouette somewhat intermediate between a buteo and a soaring falcon. The partial side view accentuates the width of the wings. Plumage details, particularly wing and tail patterns, are very useful, especially when silhouette and flight characteristics are deceptive. Buteos with similar tail patterns, such as Broad-winged and Gray hawks (*Buteo platypterus* and *nitidus*), are chunkier-bodied with relatively shorter, broader and, from beneath, paler wings. The bird is vaguely reminiscent of a Merlin (*Falco columbarius*) but is too broad in the wing and has unbarred grayish remiges rather than the Merlin's strongly barred remiges. An immature Swainson's Hawk (*Buteo swainsoni*) is strongly suggested by our bird's wing shape and pale wing linings, but is eliminated from consideration by the bold, dark-and-light banding on the tail and the unbarred remiges. All accipiters have darker heads and relatively shorter, more rounded wings with strongly barred remiges.

The bird in this photograph is a Mississippi Kite (*Ictinia mississippiensis*). The long, notched tail characteristic of the species does not show here, and the wings appear abnormally wide because of molt, soaring behavior, and angle of view. Why then is it a Mississippi Kite? The somewhat falcon-like profile, unbarred remiges, streaked underparts contrasting with white throat, and the conspicuous, even-width, light-and-dark tail bands all indicate the immature plumage of Mississippi Kite. The bird also has a very pale head contrasting with dark lores and supraorbital area. A little known and possibly distinctive feature of the immature Mississippi Kite, shown well in the photograph, is the tendency for many (all?) birds of this age to have a dusky—even all gray—subterminal pale tail band contrasting with the whiter proximal bands. This barred tail is seen to varying degrees in second-year birds, which, however, have unstreaked grayish underparts and thus more closely resemble the adult plumage.

I photographed this immature kite in August 1980, as it soared high overhead pursuing insects above the city park at Lamar, Colorado, site of a large communal nesting area, where adults, subadults and immatures can be observed.

Tim Manolis and Laurence C. Binford provided valuable comments on the content of this note. I appreciate their time and effort.

BRUCE WEBB, 5657 Cazadero Way, Sacramento, California 95822



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Cover painting by Tim Manolis: Water Pipit (*Anthus spinoletta*)

Manuscripts should be sent to Alan M. Craig, P.O. Box 374, Lakeview, CA 92353. For matters of style consult *Suggestions to Contributors to Western Birds* (6 pp. mimeo available at no cost from the Editor) and *Council of Biology Editors Style Manual* 4th edition, 1978 (available from the American Institute of Biological Sciences, 1401 Wilson Boulevard, Arlington, VA 22209 for $12.00).

Papers are desired that are based upon field studies of birds, that are both understandable and useful to amateurs, and that make a significant contribution to scientific literature. Appropriate topics include distribution, migration, status, behavior, ecology, population dynamics, habitat requirements, the effects of pollution, the techniques for identifying, censusing, sound recording and photographing birds in the field. Papers of general interest will be considered regardless of their geographic origin, but particularly desired are papers dealing with studies accomplished in or bearing on Rocky Mountain states and provinces westward, including Alaska and Hawaii, adjacent portions of the Pacific Ocean and Mexico, and western Texas.

Authors are provided 50 free reprints of each paper. Additional reprints can be ordered at author's expense from the Editor when proof is returned or earlier.

Good photographs of rare and unusual birds, unaccompanied by an article but with caption including species, date, locality and other pertinent information, are wanted for publication in *Western Birds*. Submit photos and captions to Photo Editor, Don Roberson, P. O. Box 985, Pacific Grove, CA 93950.